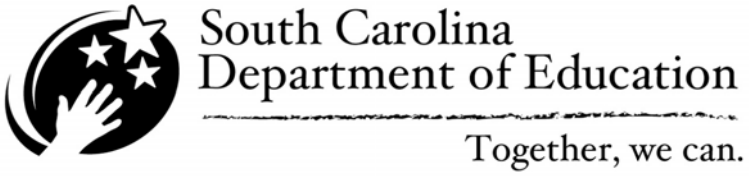
South Carolina
High School Assessment Program

English Language Arts and Mathematics
2009–10 Operational Test Technical Report



Issued by the

South Carolina Department of Education

Office of Assessment
Division of Accountability

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State Superintendent of Education

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Chapter 1

HSAP HISTORY AND OVERVIEW

The South Carolina Education Accountability Act (EAA) of 1998 mandates that all public school students pass an exit examination as one requirement for earning a high school diploma. The federal No Child Left Behind Act (NCLB) of 2001 mandates that all states assess their public high school students' academic achievement in reading, language arts, and mathematics. The High School Assessment Program (HSAP) tests were developed to meet both of these statutory requirements by serving both as a criterion for a student's eligibility to receive a South Carolina high school diploma and as a primary source for reporting the required NCLB data.

The HSAP tests were field-tested in spring 2003 to produce a sufficient number of items to build pre-equated operational test forms for both mathematics and English language arts (ELA). The first operational test was administered in spring 2004; the second and third operational tests were administered in fall 2004 and spring 2005, respectively. The first summer operational tests were administered in 2006.

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The HSAP tests were developed by the South Carolina Department of Education (SCDE) and the American Institutes for Research (AIR) in 2002 and 2003. The test administration contractors have been AIR for spring 2003 through fall 2006, Pearson for spring 2007 through fall 2008, and Data Recognition Corporation (DRC) beginning in spring 2009.

1.1 TEST PARTICIPATION REQUIREMENTS

To be eligible to take the HSAP tests, students must be enrolled in a South Carolina public school, adult education program, or homeschool program approved by the local school board. Each of the three operational test administrations has distinct student-participation requirements:

- **Spring administration.** Students in the second year after their initial enrollment in the ninth grade take the HSAP in both mathematics and ELA. Students beyond the second year after their initial enrollment in the ninth grade take any HSAP test(s) they need in order to meet the requirement for a South Carolina high school diploma.

- **Fall administration.** Students beyond the second year after their initial enrollment in the ninth grade take any HSAP test(s) they need in order to meet the requirement for a South Carolina high school diploma.

- **Summer administration.** Following a remediation program in summer school, students who have not passed the exit examination and who are planning to graduate before the beginning of the next school year take any HSAP test(s) they need in order to meet the requirement for a South Carolina high school diploma.

Any student who fails either test will be scheduled to retake that test during the next scheduled administration for which he or she is eligible. A student who follows a normal progression of course work in high school has at least five opportunities—plus a sixth opportunity during the summer of his or her twelfth-grade year if necessary—to pass the exit examination. Students who enter an adult education program will have additional opportunities to attempt the test. All

standard and non-standard accommodations available to students with disabilities and those with limited English proficiency (LEP) for the spring administration are available to these students for the fall and summer administrations, if specified in their individual education programs or 504 plans.

Beginning with the spring 2006 administration, students who were expected to graduate in the spring of the current year qualified for an expedited scoring process called Graduation Express. The number of students who qualified for Graduation Express this spring is given in Table 1.1 below.

TABLE 1.1
Students Scored through Graduation Express, Spring 2010

	Number of Students
ELA	977
Math	1686

1.2 TEST DESIGN AND STRUCTURE

Table 1.2 contains the number of items on the forms administered. The item types are multiple choice (MC), constructed response (CR), and extended response (ER).

TABLE 1.2
Number of Items

	MC	CR	ER
ELA	60	2	1
Math	62	3	NA

1.3 TECHNICAL REPORT CONTENT

This technical report summarizes the results of statistical and psychometric analyses performed on the operational data for fall, spring, and summer of the current year's for the HSAP mathematics and ELA tests. All statistics are based on students in the regular schools only; students in adult education and district-approved homeschools are excluded. For fall and summer, the data summary in all chapters of this technical report includes all students who attempted the HSAP tests. For spring, the data in chapter 2, below, also include all students who attempted the HSAP tests; the data in other subsequent chapters include only those students who attempted the HSAP tests for the first time.

Chapter 2

STUDENT DEMOGRAPHICS

2.1 STUDENT PARTICIPATION

For all HSAP administrations, demographic data have been collected on each student. These data included the categories of gender, race/ethnicity, grade, English language proficiency, lunch program eligibility, disability status, and migrant status. All data are based on students in the regular schools only; students in adult education and district-approved homeschools are excluded. For clarity, adult education and homeschool students are not included in statewide aggregate reports.

On the following pages, tables 2.1 through 2.3 report the demographic distributions. The "Invalid" category in these tables includes blanks and multiple marks. The fall pre-ID file contains data on students who did not pass the HSAP the previous spring. Because most students change grade level from spring to fall, all fall values for the variable "Grade" were taken from hand-gridded information. The high *invalid* rate for the "Grade" category is due to the fact that some students and test administrators did not grid the grade field.

Table 2.1
Fall 2009 Summary of Student Demographics in the HSAP Sample (All Attempts)

	Mathematics		ELA	
Demographics	***N***	**%**	***N***	**%**
All Students	13,345	100.00	10,181	100.00
Gender				
Female	6,424	48.14	4,260	41.84
Male	6,846	51.30	5,882	57.77
Invalid	75	0.56	39	0.38
Ethnicity				
African American	7,735	57.96	5,357	52.62
Asian/Pacific Islander	121	0.91	151	1.48
Hispanic	656	4.92	744	7.31
American Indian	23	0.17	21	0.21
White	4,336	32.49	3,516	34.53
Other	251	1.88	218	2.14
Invalid	223	1.67	174	1.71
Grade				
9	2,513	18.83	2,044	20.08
10	6,497	48.68	4,638	45.56
11	3,265	24.47	2,575	25.29
12	875	6.56	777	7.63
Invalid	195	1.46	147	1.44
ESL*				
Parent Waiver	15	0.11	20	0.20
Pre-Functional - Advanced	478	3.58	621	6.10
Initially English Proficient	10	0.07	8	0.08
Title III Exited	19	0.14	16	0.16
English Speaker I	49	0.37	45	0.44
English Speaker II	11,318	84.81	8,246	80.99
All Others	1,456	10.91	1,225	12.03
Lunch Program				
No free/reduced lunch	5,538	41.50	4,215	41.40
Free lunch	6,939	52.00	5,351	52.56
Reduced lunch	868	6.50	615	6.04
IEP**				
No	9,649	72.30	7,178	70.50
Yes	3,696	27.70	3,003	29.50
Migrant				
No	13,335	99.93	10,167	99.86
Yes	10	0.07	14	0.14
Attempt				
1st	3,611	27.06	3,492	34.30
2nd	7,482	56.07	5,285	51.91
3rd	1,220	9.14	739	7.26
4th or more	1,030	7.72	663	6.51
Invalid	2	0.01	2	0.02

* English as a second language

** individualized education program

Table 2.2
Spring 2010 Summary of Student Demographics in the HSAP Sample (All Attempts)

	Mathematics		ELA	
Demographics	***N***	**%**	***N***	**%**
All Students	59,377	100.00	57,140	100.00
Gender				
Female	29,242	49.25	27,693	48.47
Male	29,950	50.44	29,308	51.29
Invalid	185	0.31	139	0.24
Ethnicity				
African American	24,621	41.47	22,933	40.13
Asian/Pacific Islander	735	1.24	762	1.33
Hispanic	2,617	4.41	2,645	4.63
American Indian	120	0.20	119	0.21
White	29,952	50.44	29,446	51.53
Other	1,067	1.80	1,042	1.82
Invalid	265	0.45	193	0.34
Grade				
9	5,245	8.83	5,217	9.13
10	48,412	81.53	48,048	84.09
11	3,831	6.45	2,715	4.75
12	1,619	2.73	965	1.69
Invalid	270	0.45	195	0.34
ESL*				
Parent Waiver	55	0.09	57	0.10
Pre-Functional - Advanced	1,625	2.74	1,712	3.00
Initially English Proficient	24	0.04	26	0.05
Title III Exited	293	0.49	290	0.51
English Speaker I	257	0.43	249	0.44
English Speaker II	55,757	93.90	53,579	93.77
All Others	1,366	2.30	1,227	2.15
Lunch Program				
No free/reduced lunch	29,257	49.27	28,417	49.73
Free lunch	25,967	43.73	24,749	43.31
Reduced lunch	4,153	6.99	3,974	6.95
IEP**				
No	50,869	85.67	49,281	86.25
Yes	8,508	14.33	7,859	13.75
Migrant				
No	59,358	99.97	57,120	99.96
Yes	19	0.03	20	0.04
Attempt				
1st	52,653	88.68	52,611	92.07
2nd	2,310	3.89	1,754	3.07
3rd	3,200	5.39	2,083	3.65
4th or more	1,214	2.04	692	1.21
Invalid	--	--	--	--

* English as a second language

** individualized education program

Table 2.3
Summer 2010 Summary of Student Demographics in the HSAP Sample (All Attempts)

	Mathematics		ELA	
Demographics	***N***	**%**	***N***	**%**
All Students	252	100.00	133	100.00
Gender				
Female	129	51.19	60	45.11
Male	87	34.52	59	44.36
Invalid	36	14.29	14	10.53
Ethnicity				
African American	171	67.86	73	54.89
Asian/Pacific Islander	--	--	4	3.01
Hispanic	10	3.97	20	15.04
American Indian	--	--	--	--
White	34	13.49	20	15.04
Other	2	0.79	1	0.75
Invalid	35	13.89	15	11.28
Grade				
9	--	--	--	--
10	--	--	--	--
11	--	--	--	--
12	205	81.35	116	87.22
Invalid	47	18.65	17	12.78
ESL*				
Parent Waiver	--	--	--	--
Pre-Functional - Advanced	1	0.40	12	9.02
Initially English Proficient	--	--	--	--
Title III Exited	--	--	--	--
English Speaker I	1	0.40	1	0.75
English Speaker II	106	42.06	47	35.34
All Others	144	57.14	73	54.89
Lunch Program				
No free/reduced lunch	181	71.83	86	64.66
Free lunch	66	26.19	44	33.08
Reduced lunch	5	1.98	3	2.26
IEP**				
No	167	66.27	96	72.18
Yes	85	33.73	37	27.82
Migrant				
No	252	100.00	133	100.00
Yes	--	--	--	--
Attempt				
1st	8	3.17	4	3.01
2nd	13	5.16	10	7.52
3rd	15	5.95	7	5.26
4th or more	216	85.71	112	84.21
Invalid	--	--	--	--

* English as a second language

** individualized education program

2.2 STANDARD AND NON-STANDARD ACCOMMODATIONS

Supplemental information regarding the administration of the HSAP to students with disabilities is provided in the *HSAP Test Administration Manual* (*TAM*) (SCDE 2009a and 2010a). The *TAM* provides guidelines for individualized education program (IEP) teams in making decisions about testing students with disabilities; it also outlines specific information regarding testing standard and non-standard accommodations, test forms and materials, and administration procedures. A student with a documented disability either is one who has been evaluated and found to meet the eligibility criteria for enrollment in special education as defined by the Individuals with Disabilities Education Act of 1997 and State Board of Education Regulation 43-243.1 or is one who has a disability covered under Section 504 of the Rehabilitation Act of 1973.

The IEP or 504 plan team determines how a student with disabilities participates in the HSAP assessments. Decisions about standard accommodations, non-standard accommodations, and alternate assessment must be made on an individual student basis and not on the basis of the category of disability.

Standard Accommodations

The term *standard accommodation* refers to a change in the testing environment, procedures, or presentation that does not alter what the test measures or the comparability of scores. The purpose of standard accommodations is to enable students to participate in an assessment in a way that allows knowledge and skills, rather than disabilities, to be assessed.

Examples of such accommodations include changes in the test setting, timing, and scheduling: students are allowed to take the test in a different setting, such as individually or in a small group, as opposed to taking it with their class; students are allowed extended amounts of time to complete the test; and students are allowed to take the test over several days or periods during the day with frequent breaks. These are all general types of standard accommodations that can vary widely from student to student, according to what is specified in their IEP or 504 Plan. Other standard accommodations allowed include the use of a poor speller's dictionary (e.g., *The Misspeller's Dictionary*) for the ELA test, oral and signed administrations of the mathematics test, and the use of customized test materials (see section 3.4 below for more details) such as loose-leaf, large-print, and braille test booklets for both tests.

On the following pages, tables 2.4 through 2.6 present summaries of standard accommodations by the percentages of those students who were administered the test with one or more accommodations. (The column totals exceed 100 because some students received accommodations in more than one category.)

TABLE 2.4
Percentages of Students with Standard Accommodations in the Fall 2009 HSAP Administration (All Attempts)

Standard Accommodation	Mathematics		ELA	
	Regular Form (*N*=13,310)	Customized Form (*N*=35)	Regular Form (*N*=10,143)	Customized Form (*N*=38)
Setting	16.1	91.4	18.0	97.4
Presentation	12.6	94.3	14.9	100.0
Timing (IEP)	0.9	77.1	1.0	81.6
Schedule (IEP)	0.3	65.7	0.3	63.2
Response options	0.3	8.6	1.1	63.2
Loose-leaf	0.1	--	0.1	--
Large-print	1.2	--	1.0	--
Spelling dictionary	--	--	0.7	--
Supplemental Materials	0.1	65.7	0.1	65.8
Oral Admin. CD-ROM	7.9	--	9.3	--
Oral Admin. Script	5.7	5.7	6.1	2.6
Signed Admin. CD-ROM	--	37.1	--	34.2
Signed Admin. DVD	--	62.9	--	55.3
Braille	--	8.6	--	2.6
Bilingual Dictionary	1.5	--	3.6	--
Directions Translation	0.3	--	0.6	--
Individual/Small Group	1.5	2.9	2.4	7.9
Timing (ESL)	0.1	2.9	0.3	5.3
Schedule (ESL)	0.1	2.9	0.3	5.3
Alternative Scoring	--	--	4.8	68.4
Other	--	2.9	--	--

TABLE 2.5
Percentages of Students with Standard Accommodations in the Spring 2010 HSAP Administration (All Attempts)

Standard Accommodation	Mathematics		ELA	
	Regular Form (*N*=59,335)	Customized Form (*N*=42)	Regular Form (*N*=57,094)	Customized Form (*N*=46)
Setting	8.3	95.2	8.2	95.7
Presentation	6.0	97.6	6.3	95.7
Timing (IEP)	0.4	78.6	0.4	80.4
Schedule (IEP)	0.1	83.3	0.1	80.4
Response options	0.3	4.8	0.5	73.9
Loose-leaf	0.0	--	0.0	--
Large-print	0.7	--	0.8	--
Spelling dictionary	--	--	0.3	4.3
Supplemental Materials	0.0	71.4	0.0	71.7
Oral Admin. CD-ROM	3.9	2.4	4.3	2.2
Oral Admin. Script	2.6	4.8	2.1	--
Signed Admin. CD-ROM	--	47.6	--	43.5
Signed Admin. DVD	--	50.0	--	41.3
Braille	--	7.1	--	8.7
Bilingual Dictionary	0.8	--	1.2	--
Directions Translation	0.1	--	0.1	--
Individual/Small Group	0.9	2.4	1.1	10.9
Timing (ESL)	0.0	7.1	0.0	4.3
Schedule (ESL)	0.0	7.1	0.0	4.3
Alternative Scoring	--	--	2.0	71.7
Other	0.0	2.4	0.0	--

TABLE 2.6
Percentages of Students with Standard Accommodations in the Summer 2010 Accommodations (All Attempts)

Standard Accommodation	Mathematics		ELA	
	Regular Form (*N*=250)	Customized Form (*N*=2)	Regular Form (*N*=132)	Customized Form (*N*=1)
Setting	20.8	--	12.9	--
Presentation	28.4	50.0	24.2	100.0
Timing (IEP)	0.4	--	--	--
Schedule (IEP)	--	--	--	--
Response options	--	--	1.5	--
Loose-leaf	0.4	--	--	--
Large-print	1.2	--	--	--
Spelling dictionary	--	--	0.8	--
Supplemental Materials	--	--	--	--
Oral Admin. CD-ROM	22.4	--	15.2	--
Oral Admin. Script	8.4	--	9.1	--
Signed Admin. CD-ROM	--	--	--	--
Signed Admin. DVD	--	50.0	--	--
Braille	--	--	--	--
Bilingual Dictionary	1.2	--	18.2	--
Directions Translation	--	--	--	--
Individual/Small Group	2.4	50.0	3.0	--
Timing (ESL)	--	--	--	--
Schedule (ESL)	--	--	0.8	--
Alternative Scoring	--	--	11.4	--
Other	--	--	--	--

Non-standard Accommodations

The term *non-standard accommodation* refers to a change in the testing environment, procedures, or presentation that compromises test validity and may alter the meaning and comparability of test scores. Non-standard accommodations are appropriate only for those students with disabilities who, owing to the nature of their disabilities, are unable to take the HSAP tests without such accommodations. Any non-standard accommodations used in HSAP testing should be the same as those used by the student in routine instruction and assessment.

Non-standard accommodations for ELA include extended-response writing options (e.g., spell checker, grammar checker). If a student is allowed a non-standard accommodation, the accommodation is noted on the roster reports provided to the schools and districts and on the individual score reports. The summary results include scores for students who used non-standard accommodations. Table 2.7, below, presents summaries of non-standard accommodations by percentages.

TABLE 2.7

Percentages of Students with Non-standard Accommodations in the 2009–10 HSAP Administrations (All Attempts)

Non-standard Accommodation	Regular Form	Customized Form
Fall 2009	**(*N*=10,143)**	**(*N*=38)**
Extended response options	0.5	60.5
	Regular Form	**Customized Form**
Spring 2010	**(*N*=57,094)**	**(*N*=46)**
Extended response options	0.2	67.4
	Regular Form	**Customized Form**
Summer 2010	**(*N*=132)**	**(*N*=1)**
Extended response options	3.8	0.0

Chapter 3

TEST ADMINISTRATION

3.1 TEST ADMINISTRATION WINDOW

The HSAP ELA operational tests for fall and spring were conducted in two sessions over two days. The mathematics tests were conducted in a single, one-day session. For the summer administration, school districts were responsible for identifying the test dates for each subject within the prescribed three-day window. There were no makeup testing days for the summer administration.

TABLE 3.1
2009–10 HSAP Test Administration Schedule

Fall 2009		Spring and Summer 2010	
Date	**Test**	**Date**	**Test**
October 20	ELA (day 1)	April 20	ELA (day 1)
October 21	ELA (day 2)	April 21	ELA (day 2)
October 22	Mathematics	April 22	Mathematics
October 23-30	Makeup tests window	April 23-30	Makeup tests window
		July 20-22	Summer tests window

The district test coordinators (DTCs) were instructed to administer makeup tests to all eligible students. The administration of one test per day was recommended, but the DTCs were advised that students could take both subjects on one day if necessary.

3.2 TEST DURATION

The HSAP tests were not timed; however, students were required to complete each testing session during a single day (unless a student's IEP or 504 plan specifically stated that he or she needed an administration spanning several days). The following time *estimates* were provided to districts and schools for scheduling purposes only:

ELA, session 1 ..... 2 hours
ELA, session 2 ..... 2 hours
Mathematics ..... 3 hours

In the administration manuals, procedures were outlined for accommodating students who needed time beyond these estimated hours to finish a particular test. Test administrators (TAs) were instructed to give these students as much time as they needed to complete the test, provided that school staff and space were available.

Students were asked to record the times they started and finished the tests. In ELA, students recorded the times for sessions 1 and 2. The recorded times were scanned, and the total testing time was calculated. Table 3.2 reports the breakdowns by percentages. "Invalid" refers to blank or multiple responses. Total testing times for students whose responses fell into this category could not be calculated.

Table 3.2
Percentage of Students by Test Duration:
HSAP Fall 2009, Spring 2010, and Summer 2010 (All Attempts)

	Fall 2009			Spring 2010			Summer 2010		
	Math % (*N*=13,345)	ELA % (*N*=10,181)		Math % (*N*=59,377)	ELA % (*N*=57,140)		Math % (*N*=252)	ELA % (*N*=133)	
Time Taken		Session 1	Session 2		Session 1	Session 2		Session 1	Session 2
15 min	0.26	0.79	0.66	0.23	0.74	0.35	--	--	0.75
30 min	0.88	4.14	3.80	0.59	5.97	1.49	--	0.75	--
45 min	3.60	10.10	12.82	3.05	16.06	9.18	--	6.02	--
1 hr	9.01	16.96	19.41	11.39	23.36	23.05	1.59	15.04	6.77
1 hr 15 min	12.87	16.19	16.88	18.21	19.00	23.57	2.78	11.28	5.26
1 hr 30	14.42	13.56	12.60	19.19	13.30	16.42	8.73	15.04	13.53
1 hr 45	12.96	10.65	8.98	14.96	8.33	9.86	9.13	8.27	10.53
2 hr	11.41	8.30	6.33	11.54	4.77	5.83	11.90	8.27	12.03
2 hr 15 min	8.17	4.87	4.51	6.88	2.66	3.17	9.92	10.53	10.53
2 hr 30 min	6.35	3.28	2.36	4.21	1.46	1.70	11.51	10.53	9.77
2 hr 45 min	4.35	2.02	1.18	2.15	0.69	0.92	7.14	6.02	6.77
3 hr +	8.73	4.11	3.45	4.17	1.55	1.71	32.54	6.77	23.31
Invalid	6.99	5.03	7.03	3.42	2.12	2.75	4.76	1.50	0.75

3.3 ADMINISTRATION MANUALS

DRC worked with SCDE staff to produce administration manuals for the test. Two types of manuals were produced: the *HSAP Test Administration Manual* (*TAM*) and the *HSAP District Test Coordinator's Supplement* (SCDE 2009b and 2010b). The supplement included information that the DTCs needed for the administration of the HSAP tests. The *TAM* contained the information that the school test coordinators (STCs), TAs, and monitors needed to administer the tests to students in their schools. In addition, the summer 2010 supplement (SCDE 2010c) was produced to provide specific information for the summer 2010 administration and was used in conjunction with the information provided in the spring 2010 manuals.

3.4 CUSTOMIZED MATERIALS

Customized versions of the tests were available for ELA and mathematics. Six different customized formats of the HSAP tests were available for these administrations.

- Form A loose-leaf answer documents, which were printed, single sided, in three-ring binders, allowed individuals to remove the pages so that they could write or type answers to the constructed-response and extended-response items.
- Form A large-print booklets could be used for students who have difficulty reading text in a standard-size font. The large-print version was printed in a 9 x 12-inch spiral-bound booklet in an 18-point sans serif font.
- Form C braille booklets were produced for students who typically read classroom materials in braille. The braille versions were printed on 11½ x 11-inch interpoint braille pages and placed in three-ring binders.

- Form A oral administration scripts and audio CD-ROMs were provided for students whose 504 and IEP plans were written to require oral administration of tests. Scripts provided the directions to the TAs regarding the appropriate way to read test questions, passages, and some answer choices to the students. Audio CD-ROMs were used for students testing individually or in small-group settings.
- Form C Braille scripts and CDs were produced for testing visually impaired students.
- Form C sign language DVDs were also produced and included the signed test directions, test questions, and some answer choices. The DVDs were produced in two languages: American Sign Language (ASL) and Pidgin Signed English (PSE).

3.5 PRETEST WORKSHOPS AND TRAINING

Web-based pretest workshops were held to train DTCs and other district staff. All DTCs were invited and could bring additional representatives to the workshop. SCDE and DRC staff trained the district staff.

Contractor staff discussed the HSAP manuals, reviewed test security procedures, and provided other pertinent information, including an overview of the instructions for administering tests to students with disabilities. Special focus was given to new procedures as well as any recent changes in procedure.

The *TAMs* were mailed to the DTCs two weeks before the workshops, as well as posted online. The *DTC Supplements* were posted online the same day the *TAMs* were mailed to the districts. In addition, the PowerPoint presentations were posted online. For the summer administration, *HSAP Summer Supplements* were posted online; spring *TAMs* were reused by the districts.

3.6 MATERIALS SHIPPING AND RETURN

Test materials were shipped to the district offices by DRC to arrive at least two weeks before testing. Each school's shipment was boxed individually and labeled with the number of boxes shipped for that school. The DRC shipment to each district office also included a 10 percent overage of all test materials—with the exception of customized formats, which were sent only in the quantities ordered. The 10 percent overage was in addition to the 5 percent overage included in school shipments. Overage materials for the districts were to be used by the DTCs to fulfill any additional materials requests from the STCs. The summer 2010 shipment did not include any overage materials.

The TAs were instructed to return test materials to their respective STCs immediately after test administration. The STCs redistributed test materials to the TAs, who then administered makeup tests. Those TAs were instructed to return the makeup materials at the end of the makeup session. The STCs were instructed to return all materials—scorable and nonscorable—to their DTCs within one business day after makeup testing.

The *DTC Supplement* included step-by-step directions on how to return scorable and nonscorable materials. These directions listed toll-free phone numbers to call to schedule pickups of returned materials. The DTCs were given specific dates in the manuals for returning materials to DRC. For spring testing, an additional shipment was made for students designated as "Graduation Express."

3.7 TEST SECURITY

The State Board of Education promulgated revised test security regulations (24 S.C. Code Ann. Regs. 43-100) that became effective on June 27, 2003. These regulations were implemented for the first time in the 2004 PACT administration. New test security violations procedures were also developed with the assistance of SLED (State Law Enforcement Division).

Test security prior to, during, and following test administration was regarded as critical. The specific procedures that were followed during the test administration and used in the handling of documentation were those outlined in the *TAM.* Reprinted in this manual are excerpts from Section 59-1-445 of the South Carolina Code of Laws, Section 59-1-447 of the Code, Section 59-30-10(i) of the Code, and State Board of Education Regulation 43-100.

The following guidelines were also included in the *TAM*:

- The STCs were to observe test administration activities and monitor adherence to test security. Examinees were to be made aware that monitoring might occur.
- All secure test materials were required to be kept in a secure, locked location when not in use.
- Before testing, access to secure materials was to be restricted to supervised sessions conducted by the STCs. Supervised sessions for coding answer document demographic information could be held the week before testing. Review of test administration directions in oral and signed administration scripts was to be restricted to supervised sessions held after school on the day before each test.
- After testing, access to secure materials was required to be restricted to makeup testing sessions and supervised sessions for completing or editing demographic codes on student answer documents.
- The TAs were instructed to walk around the room during testing to check that students were marking their answers in the appropriate areas of the answer documents. It was permissible to alert students if they were marking their answers in the wrong areas. However, it was not permissible to read test items or students' responses.

Following the test administration and the return of materials, DRC sent missing materials letters to districts identifying the number of unreturned secure materials and the barcode numbers of each missing document. The districts had two weeks to respond to the letter before DRC attempted to contact the DTCs by telephone. Subsequently, the districts either located and returned the materials or sent explanations as to why materials were not found. A toll-free telephone number was provided to answer the DTCs' questions regarding the missing materials; in addition, follow-up procedures were employed until all materials were accounted for.

Secure Materials

It was explained to districts and schools that secure materials included regular-print answer documents and all customized test materials. In addition, reference sheets, scratch paper, and separate pages containing student writing were considered as secure materials and had to be returned with the nonscorable materials after administration of the tests. The DTCs and the STCs were instructed to keep secure materials in locked storage at all times when not in use. These

materials were not to be left unattended at any time. Additional security policies requiring secure storage, limited access to items, and secure disposal of documents were explained in the manuals and at the pretest workshops.

Agreements to maintain test security and confidentiality were provided in the *TAM*. DTCs were instructed to require all persons with access to test materials to sign test security agreements if not on file for the current school year. This necessity was stressed repeatedly in the manuals and during the pretest workshops.

Chapter 4

SCORING

The criteria used to score HSAP items were based on the item type. Multiple-choice items were scored using item keys indicating each correct option; constructed-response and extended-response items were scored on the basis of scoring rubrics. For extended-response items, a set of scoring rules was applied in creating final scores. This chapter describes the types of items used on the HSAP assessment, the scoring rules that were applied, and reader reliabilities.

4.1 TYPES OF ITEMS

The HSAP tests included three types of items: multiple choice, constructed response, and extended response.

Multiple-Choice

For multiple-choice items, students selected one of four options: A, B, C, or D. Each multiple-choice item was scored as 1 for the correct response and 0 for an incorrect response. Missing responses (i.e., items that a student did not answer at all) and multiple responses were scored as incorrect.

Constructed-Response

Constructed-response items were scored using a generic rubric on a 0 to 3 scale. Condition codes of B ("blank") and UR ("unreadable" or "illegible") were used for nonscorable responses. For the purpose of calculating the total score, the condition codes were recoded as 0.

For the purpose of monitoring rater quality, 15 percent of the responses to each constructed-response item by students who had not qualified for Graduation Express were double-read without resolution. The score assigned by the primary reader was taken as the final score for each constructed-response item. A detailed scoring rubric providing descriptions of the various score points was used in the scoring process.

For the Graduation Express students, all answers to constructed-response items were read by two raters. The final score was determined on the basis of the following rules:

- If the first reader's score was equal to the second reader's score, the reported score was the first reader's score.
- If the first reader's score was different from the second reader's score, a resolution was required.
- If the third reader's score agreed exactly with the first or the second reader's score, the third reader's score was the resolution score.
- If the third reader's score was different from the first or the second reader's score, the reported score was the adjudication score.

Extended-Response

An extended-response writing item was administered at the beginning of session 1 of the ELA test and was scored under four domains: content and development, organization, voice, and conventions. Score ranges for these domains are 1–4 for content and development, 1–4 for organization, 1–3 for voice, and 1–4 for conventions, for a total possible score of 15 points. Each extended-response item was independently read by two raters, for a total possible composite score of 30 points. In addition to the double scoring of the extended-response item, about 8 percent of the papers were back-read by chief readers.

For the nonscorable responses, condition codes of B ("blank"), OT ("off topic"), IS ("insufficient" response), and UR ("unreadable" or "illegible response") were assigned. For scoring purposes, the condition codes were recoded as 0. The algorithm for scoring extended-response writing is presented in table 4.1 for scorable responses (e.g., 1–4 or 1–3 for domain scores). When a paper received a condition code, the paper was pulled and scored by supervisors. The scoring rules for these papers are presented in table 4.2. As with the constructed-response items, the extended-response items were also scored with a detailed rubric that was generic across all extended-response items.

For the Graduation Express students, each extended-response item was independently scored by two readers. To produce a final score, the two scores were processed according to the scoring algorithms shown in tables 4.1 and 4.2, on the following page.

Graduation Express Automatic Rescore

The regular appeal process does not allow hand-scored responses of Graduation Express students to be rescored in time for graduation. Consequently, for the spring administrations of 2006, 2007, and 2008, all Graduation Express students' CR and ER responses were automatically rescored. The higher score was used to calculate the student's final score.

Starting with the spring 2009 administration, the automatic rescore procedure for Graduation Express students was changed to apply only to graduating seniors who initially scored at level 1. The rescored response value for these students had been used to calculate the student's final score since spring 2009.

TABLE 4.1

HSAP Extended-Response Scoring Algorithm for Papers with Scorable Responses

Rule	First Score (R1)	Second Score (R2)	Action	Back Reading (BR)	Resolution Score (RS) [Third Score]	Final Score (F)
1	R1 = 1–4	R2 = R1	none	NA	NA	F = R1 + R2
2	R1 = 1–4	R2 = 1–4 *and* is adjacent to R1	none	NA	NA	F = R1 + R2
3	R1 = 1–4	R2 = 1–4 *and* is nonadjacent to R1	resolution required	NA	RS = R1	F = RS + R1
4	R1 = 1–4	R2=1–4 *and* is nonadjacent to R1	resolution required	NA	RS = R2	F = RS + R2
5	R1 = 1–4	R2 = 1–4 *and* is nonadjacent to R1	resolution required	NA	RS is adjacent to R1 and R2	F = RS + RS
6	R1 = 1–4	R2 = 1–4 *and* is nonadjacent to R1	resolution required	NA	RS is adjacent to R1 or R2 but not both	F = RS + R1 if R1 is closer to RS than R2 F = RS + R2 if R2 is closer to RS than R1
7	R1 = 1–4	R2 = R1	NA	BR = R1 = R2	NA	F = BR + R1
8	R1 = 1–4	R2 = R1	NA	BR is adjacent to R1 and R2	NA	F = BR + R1
9	R1 = 1–4	R2 = R1	NA	BR is nonadjacent to R1 and R2	NA	F = BR + BR
10	R1 = 1–4	R2 = 1–4 and R2 is adjacent to R1	NA	BR = R1 and adjacent to R2	NA	F = BR + R1
11	R1 = 1–4	R2 = 1–4 and R2 is adjacent to R1	NA	BR = R2 and adjacent to R1	NA	F = BR + R2
12	R1 = 1–4	R2 = 1–4 and R2 is adjacent to R1	NA	BR is adjacent to R1 and discrepant to R2	NA	F = BR + R1
13	R1 = 1–4	R2 = 1–4 and R2 is adjacent to R1	NA	BR is adjacent to R2 and discrepant to R1	NA	F = BR + R2
14	R1 = 1–4	R2 = 1–4 and R2 is adjacent to R1	NA	BR is nonadjacent to R1 and R2	NA	F = BR + BR

TABLE 4.2

HSAP Extended-Response Scoring Algorithm for Papers with Condition Codes

Rule	Supervisor First Score (S1)	Supervisor Second Score (S2)	Action	BR	Supervisor Resolution Score (S3)	Final Score (F)
1	S1 = condition code	S2 = S1	none	NA	NA	F = S1
2	S1 = 1–4	S2 = condition code	resolution required	NA	S3 = 1–4	F = S3 + S1
3	S1 = condition code	S2 = 1–4	resolution required	NA	S3 = 1–4	F = S3 + S2
4	S1 = 1–4	S2 = condition code	resolution required	NA	S3 = condition code	F = S3
5	S1 = condition code	S2 = condition code but not equal to S1	resolution required	NA	S3 = condition code	F = S3
6	S1 = condition code	S2 = condition code but not equal to S1	resolution required	NA	S3 = 1–4	F = S3 + S3

4.2 TEST SPECIFICATIONS

The HSAP test specifications for mathematics and ELA are shown in tables 4.3 and 4.4, below. As noted previously, the HSAP assessments include multiple-choice, constructed-response, and extended-response items. The integrated-response items are 3-point constructed-response items that integrate content standards and process standards; they require students to use the process skills of problem solving, communication, representations, and connections to apply a solution strategy and then to communicate and represent the result.

TABLE 4.3

HSAP Mathematics: Distribution of Score Point Values by Reporting Category

All Administrations	Algebra	Data Analysis and Probability	Measurement and Geometry	Number and Operations	Integrated Responses
Percentage	26.76	11.27	26.76	22.54	12.68
Multiple-choice points	19	8	19	16	0
Constructed-response points	0	0	0	0	9

TABLE 4.4

HSAP ELA: Distribution of Score Point Values by Reporting Category

	Reading Process and Comprehension	Analysis of Texts	Word Study and Analysis	Research	Writing
Fall 2009					
Percentage	32.10	19.75	9.88	9.88	28.40
Multiple-choice points	20	16	8	8	8
Constructed-response points	6	0	0	0	0
Extended-response points	0	0	0	0	15
Spring 2010					
Percentage	32.10	19.75	9.88	9.88	28.40
Multiple-choice points	20	16	8	8	8
Constructed-response points	6	0	0	0	0
Extended-response points	0	0	0	0	15
Summer 2010					
Percentage	32.10	19.75	9.88	9.88	28.40
Multiple-choice points	20	16	8	8	8
Constructed-response points	6	0	0	0	0
Extended-response points	0	0	0	0	15

4.3 SCORING PROCESS

DRC scored all items. The multiple-choice items were scored by DRC's electronic scanning system; CR and ER items were scored by trained personnel at DRC's Austin, TX scoring site in fall 2009 and spring 2010. In summer 2010, the ELA CR items were scored at DRC's Woodbury, MN scoring site; ER and mathematics CR items were scored in Austin, TX. SCDE staff were on-site during the first week of training in fall 2009 and spring 2010. They oversaw both the training of reader leaders and the initial training of all readers. Throughout the scoring process, the contractor posted the performance of each reader (reader-reliability statistics). SCDE staff did not oversee training or scoring in summer 2010.

Before starting to score the live CR and ER items, readers have to pass two of three qualifying sets. Each qualifying set consists of 20 papers. The qualification requirement is as follows:

- ELA ER: 70 percent exact and 85 percent adjacent on 2 of 3 sets with 20 papers in each set
- ELA CR: 90 percent exact on 2 of 3 sets with 20 papers in each set
- Math CR: 90 percent exact on 2 of 3 sets with 20 papers in each set.

Before qualifying and throughout the scoring process, readers' performances were monitored through the use of validity papers, which are prescored responses distributed to readers throughout scoring to ensure that readers, as well as scoring supervisors, do not drift from the scoring rubric. "True scores" for these papers were assigned by SCDE staff and contractor content specialists and scoring directors. The quality check was "blind" in that readers did not know they were scoring a validity paper. In addition to validity, quality was monitored through the use of reader reliability and score-point-distribution reports. Reader agreement was checked on a regular basis: every twenty papers for the extended-response item and every sixty papers for CR items.

4.4 READER RELIABILITY

In the scoring of constructed-response and extended-response items, 15 percent of the papers for CR items and 100 percent of the papers for ER items were independently scored by two readers. The percentages of reader consistency on the papers that were double-scored are reported in table 4.5, on the following page.

The reported reader-reliability indexes are rates of perfect agreement and rates of perfect and adjacent agreement. The term *perfect agreement* indicates that the two readers assigned the same score to the same written response. The term *adjacent agreement* indicates that the two readers differed by one point when evaluating the same response.

TABLE 4.5

Reader Reliabilities for Scoring HSAP Constructed-Response and Extended-Response Items

Items	*N*	Percentage of Perfect Agreement	Percentage of Perfect and Adjacent Agreement
Mathematics			
Fall 2009 (All Attempts)			
CR1	2,214	90.2	100.0
CR2	2,246	93.4	100.0
CR3	2,230	94.7	100.0
Spring 2010 (First Attempts)			
CR1	8,935	94.9	100.0
CR2	8,844	93.4	99.9
CR3	8,845	95.2	99.8
Summer 2010 (All Attempts)			
CR1	45	95.6	100.0
CR2	36	97.2	100.0
CR3	40	97.5	100.0
ELA			
Fall 2009 (All Attempts)			
CR1	1,740	87.9	99.9
CR2	1,706	88.8	100.0
ER content and development	10,181	80.8	99.7
ER organization	10,181	79.0	99.7
ER voice	10,181	81.2	99.8
ER convention	10,181	75.2	99.4
Spring 2010 (First Attempts)			
CR1	8,875	91.7	100.0
CR2	8,908	90.4	100.0
ER content and development	52,611	77.5	99.7
ER organization	52,611	75.8	99.5
ER voice	52,611	78.1	99.8
ER convention	52,611	75.2	99.0
Summer 2010 (All Attempts)			
CR1	24	83.3	100.0
CR2	26	84.6	100.0
ER content and development	133	79.7	100.0
ER organization	133	78.2	100.0
ER voice	133	75.9	100.0
ER convention	133	75.9	100.0

4.5 TESTED/NOT TESTED FLAG

A student was considered "tested" in mathematics if he or she answered at least one question. The question could have been a multiple-choice or constructed-response item. A student was considered "tested" in ELA if he or she answered at least one question on either of the two days of testing. The one question could have been a multiple-choice item, constructed-response item, or extended-response item.

Chapter 5

TECHNICAL CHARACTERISTICS OF ITEMS

This chapter reports the results of item analyses based on classical test theory (CTT). Item difficulty (*p*) is the proportion (or percentage) of examinees correctly answering a dichotomously scored item. The term *item discrimination* refers to a correlation between the student's item score and the student's total score. For the discrimination index of a particular item, point-biserial correlations were produced. In the calculation of the point-biserial correlation for a particular item, that item was excluded from the total score.

A "not-reached" (NR) item was any one to which a student did not respond after the last item that he or she attempted in a session. In other words, an item was not reached if the student did not respond to it or to any other item after it. An "omit" was any nonresponse item appearing between items with responses.

In recoding missing data for item analysis, all omitted and NR items were recoded as incorrect, with a zero score. It was decided to exclude from the CTT item analyses those students who had used customized materials and those who had received the alternative scoring rubric non-standard accommodation. These students were also excluded during the item calibration conducted prior to building pre-equated forms. This calibration was conducted by the AIR in coordination with the SCDE.

5.1 ITEM NONRESPONSE RATES

Although the HSAP tests were not timed, students were required to finish each test session during one school day, unless they had an IEP that allowed for accommodations in administration. The TAs were instructed that the expected test duration for each ELA session would be about two hours and that the mathematics test could be expected to run approximately three hours.

The percentage of students who responded to the last two items on a given test form was computed. Table 5.1, below, presents the average of these percentages across the different forms for each subject. The percentages listed in the "Last Item" column of the table represent those students who responded to the last item—constructed-response (CR) item 3 (question 65) for mathematics, a multiple-choice (MC) item in both sessions 1 and 2 for ELA. The percentages in the adjacent column include students who omitted the last item on the test but who answered the second-to-last item—CR item 2 (question 64) for mathematics, item 19 in fall, item 15 in spring, and item 14 in summer in session 1 and item 59 in fall, spring, and summer in session 2 for ELA. Item nonresponse rates were computed for each ELA session separately. Students tend to leave CR items blank more often than they leave MC items blank, especially when the CR items appear at the end of the test. (Question numbers above are for Form A only.)

TABLE 5.1

Percentages of Students Responding to Last and Second-to-Last HSAP Items

Subject	Last Item	Second-to-Last Item
Fall 2009 (All Attempts)		
Mathematics	92.4 (CR)	91.4 (CR)
ELA Session 1	99.0 (MC)	99.0 (MC)
ELA Session 2	98.7 (MC)	98.8 (MC)
Spring 2010 (First Attempts)		
Mathematics	95.5 (CR)	95.5 (CR)
ELA Session 1	99.5 (MC)	99.5 (MC)
ELA Session 2	99.7 (MC)	99.6 (MC)
Summer 2010 (All Attempts)		
Mathematics	99.2 (CR)	99.2 (CR)
ELA Session 1	100.0 (MC)	100.0 (MC)
ELA Session 2	100.0 (MC)	100.0 (MC)

5.2 CLASSICAL ITEM STATISTICS

Table 5.2 provides a summary of item *p*-values and item discrimination values by item type and content area. For constructed-response and extended-response items, the *p*-value was computed as the ratio of the item mean to the item's maximum possible score. For the discrimination index, point-biserial correlations were computed between the item and the total raw score as the criterion. In the computing of the point-biserial correlation, the item score was excluded from the total raw score.

TABLE 5.2

Summary of Classical Item Statistics for HSAP Mathematics and ELA

Item Type/Content Area	Number of Items	*p*-value	Point–Biserial Correlation	Number of Items	*p*-value	Point–Biserial Correlation	Number of Items	*p*-value	Point–Biserial Correlation
	Fall 2009 (All Attempts)			Spring 2010 (First Attempts)			Summer 2010 (All Attempts)		
Mathematics									
Multiple-choice	62	0.51	0.31	62	0.69	0.40	62	0.49	0.21
Constructed-response	3	0.38	0.56	3	0.63	0.65	3	0.33	0.44
Number and Operations	16	0.57	0.31	16	0.78	0.41	16	0.55	0.22
Algebra	19	0.53	0.31	19	0.68	0.38	19	0.53	0.23
Measurement and Geometry	19	0.42	0.32	19	0.63	0.38	19	0.40	0.18
Data Analysis and Probability	8	0.54	0.29	8	0.67	0.44	8	0.49	0.22
ELA									
Multiple-choice	60	0.55	0.33	60	0.72	0.36	60	0.48	0.16
Constructed-response	2	0.39	0.53	2	0.56	0.48	2	0.38	0.29
Extended-response	1	0.76	0.68	1	0.85	0.74	1	0.73	0.54
Reading Process and Comprehension	22	0.58	0.33	22	0.78	0.36	22	0.49	0.18
Analysis of Texts	16	0.53	0.33	16	0.62	0.34	16	0.49	0.19
Word Study and Analysis	8	0.59	0.37	8	0.84	0.41	8	0.51	0.10
Research	8	0.53	0.33	8	0.66	0.36	8	0.43	0.09
Writing	9	0.52	0.36	9	0.68	0.40	9	0.49	0.13

Chapter 6

ITEM CALIBRATION AND SCALING

6.1 METHODOLOGY AND SOFTWARE

The Rasch model was used in the item calibrations of the HSAP items. The one-parameter Rasch model (Rasch 1980; Wright and Stone 1979) was used to calibrate multiple-choice items. Constructed-response and extended-response items were calibrated with the Rasch partial credit model (Masters 1982). Calibrating mixed item types from different assessment modes (i.e., dichotomously and polytomously scored items) requires the use of a polytomous model, which allows the number of score categories (typically score points on a scoring rubric) to vary across assessment modes. The Rasch partial credit model (Wright and Masters 1982) can accommodate the mixing of dichotomous and polytomous items.

The Rasch partial credit model is widely used for high school graduation exams, particularly those with high stakes for students and educators. The AIR used a one-to-one translation from the number of correct responses to the scale score in the Rasch model. Maintaining a correspondence between the raw number correct score and the scale score, while simultaneously equating multiple test forms, posed a challenge that was best met by using the one-parameter Rasch dichotomous model and the Rasch partial credit model (Wright and Masters 1982).

The WINSTEPS software program (Linacre and Wright 2003) was used in the item calibration. WINSTEPS uses the joint maximum-likelihood estimation (JMLE) approach, which estimates the item and person parameters simultaneously. Although this estimation method is subject to small statistical biases, which increase as the length of the scale decreases, these biases were corrected through the use of the WINSTEPS feature STBIAS=Y.

6.2 ITEM CALIBRATION

For both mathematics and ELA, the equated HSAP operational test forms were constructed from the precalibrated item pool; therefore, the raw-score-to-scale-score conversion tables for the operational forms were created before the tests were administered.

6.3 SCALING

Based on the precalibrated item pool, Rasch-ability-score-to-scale-score conversion tables were generated for each subject. These scores took into account any differences in the difficulty of the forms due to pre-equating; that is, all items shared a common metric so that the scale scores developed for each form were automatically adjusted for differences in item difficulty.

The following process is used to convert Rasch ability scores to scale scores:

Step 1: A linear transformation is applied to the Rasch scores ($\hat{\theta}$), such that the Level 2 cut score (SS_C) equals 200 and the standard deviation of scales scores (B) is 25,

$$SS = SS_C + B\left[\frac{\hat{\theta} - \theta_C}{\sigma_{\hat{\theta}}}\right]$$

, where the Rasch passing scores (θ_C) are -0.224 for mathematics and 0.015 for ELA, and the standard deviations of *theta* ($\sigma_{\hat{\theta}}$) are 1.102 for mathematics and 1.046 for ELA.

Step 2: Noninteger scale scores are rounded down to whole numbers.

Step 3: Scale scores less than 100 and greater than 320 are reported as 100 and 320, respectively.

6.4 DEFINITION OF SCOREABILITY

A student is considered "tested" if he or she has answered at least one question. All tested students' item responses are scored. All omits and not-reached items are counted as incorrect and scored as a zero.

6.5 REPORTING OF ZERO AND PERFECT SCORE

In item response theory (IRT) maximum-likelihood ability estimation methods, zero and perfect scores are assigned the value of negative and positive infinity, respectively. The AIR used the WINSTEPS default setting in estimating the extreme values. That is, a fractional score point value was subtracted from perfect scores and was added to zero scores.

6.6 POLICY DEFINITION OF ACHIEVEMENT LEVELS

After the spring 2003 HSAP census field test, the AIR, in collaboration with its partner Insite, Inc., conducted standard-setting workshops for the HSAP mathematics and ELA examinations on July 21–25, 2003. For each subject, the workshop participants recommended three achievement-level cut scores: Level 2, Level 3, and Level 4. Level 2 was the cut required for student graduation purposes, and Levels 3 and 4 described students for AYP (adequate yearly progress) purposes. Achievement-level descriptions are provided on the following pages in tables 6.1 and 6.2. The AIR outlined the details of the standard-setting process in its 2004 report to the SCDE, "South Carolina High School Assessment Program English Language Arts and Mathematics Standard Setting Technical Report."

TABLE 6.1
Description of Achievement Levels for the HSAP Mathematics Test

Level	Description
4	The Level 4 student • has demonstrated an exceptional command of skills and knowledge required of high school students in South Carolina • analyzes, evaluates, and/or synthesizes mathematical concepts and procedures and solves problems using advanced arithmetic, algebraic, and measurement/geometric concepts and relationships • analyzes data representations and applies probability concepts • supports answers with mathematical work and/or explanations that thoroughly communicate mathematical reasoning • has met the exit examination requirement for a South Carolina high school diploma
3	The Level 3 student • has demonstrated proficiency in skills and knowledge required of high school students in South Carolina • applies mathematical concepts and procedures and solves problems using arithmetic, algebraic, and measurement/geometric concepts and relationships • interprets data representations and demonstrates a knowledge of probability concepts • supports answers with mathematical work and/or explanations that clearly communicate mathematical reasoning • has met the exit examination requirement for a South Carolina high school diploma
2	The Level 2 student • has demonstrated competence in skills and knowledge required of high school students in South Carolina • demonstrates an acceptable knowledge of fundamental mathematical concepts and procedures and solves problems using essential arithmetic, algebraic, and measurement/geometric concepts and relationships • demonstrates a knowledge of basic data representations and probability concepts • supports answers with mathematical work and/or explanations that adequately communicate mathematical reasoning • has met the exit examination requirement for a South Carolina high school diploma
1	The Level 1 student • has not demonstrated competence in the skills and knowledge required of high school students in South Carolina • demonstrates a limited understanding of mathematical concepts • is able to use arithmetic, algebraic, and measurement/geometric concepts and relationships • demonstrates a knowledge of simple data representations and probability concepts • supports answers with mathematical work and/or explanations that minimally communicate mathematical reasoning • has not met the exit examination requirement for a South Carolina high school diploma

TABLE 6.2
Description of Achievement Levels for the HSAP ELA Test

Level	Description
4	The Level 4 student • has demonstrated an exceptional command of skills and knowledge required of high school students in South Carolina • demonstrates comprehension of complex ideas and connects those ideas within a text, across texts, and beyond the text • displays exceptional writing skills by engaging the reader, effectively developing and organizing ideas, and using relevant supporting details, vivid language, and Standard American English • has met the exit examination requirement for a South Carolina high school diploma
3	The Level 3 student • has demonstrated proficiency in skills and knowledge required of high school students in South Carolina • demonstrates comprehension of complex ideas and connects those ideas within a text and across texts • displays effective writing skills by sustaining the reader's interest, clearly developing and organizing ideas, and using relevant supporting details and Standard American English • has met the exit examination requirement for a South Carolina high school diploma
2	The Level 2 student • has demonstrated competence in skills and knowledge required of high school students in South Carolina • demonstrates comprehension of essential ideas and shows some logical connections of those ideas within a text • displays acceptable writing skills by showing some awareness of audience, developing and organizing ideas, and using relevant supporting details and Standard American English • has met the exit examination requirement for a South Carolina high school diploma
1	The Level 1 student • has not demonstrated competence in skills and knowledge required of high school students in South Carolina • demonstrates limited comprehension of ideas and tenuous connections of those ideas within a text • displays limited writing skills, which may include little awareness of audience and purpose, partial development and organization of ideas, and deviations from Standard American English • has not met the exit examination requirement for a South Carolina high school diploma

6.7 CUT SCORES FOR ACHIEVEMENT LEVELS

The cut scores for the various HSAP achievement levels are presented in table 6.3.

TABLE 6.3

Rasch Ability and Scale Score Cut Scores for HSAP Achievement Levels

	Level 2	Level 3	Level 4
Mathematics			
Rasch Ability	-0.224	0.658	1.584
Scale Score	200	220	241
ELA			
Rasch Ability	0.015	0.978	1.731
Scale Score	200	223	241

These cut scores were derived from the HSAP standard-setting study and do not vary across test forms.

6.8 CONTENT-AREA INFORMATION

In addition to total scores, information was reported for four content areas in mathematics and five content areas in ELA. For each content area, the following steps were taken:

Step 1: A raw-score-to-Rasch-ability-score conversion table was generated for each content area. The empirical Level 2 cut score (i.e., the raw score with the lowest Rasch ability value equal to or greater than the Level 2 Rasch ability cut score for the total test) was located on each content-area scale.

Step 2: A 68 percent confidence interval of the cut score (θ_c) was computed as cut score (θ_c) $\pm$ 1 SE(θ_c). The scores were grouped into one of three classifications as follows:

1 - *Needs improvement*: if $\theta < \theta_c$ -1 SE
2 - *May need improvement*: if θ_c -1 SE $\leq \theta < \theta_c$ + 1 SE
3 - *[No descriptor used]* if $\theta \geq \theta_c$ + 1 SE

The empirical Rasch-ability-score-to-content-area cut scores used for the three classifications for each content area are provided in table 6.4.

TABLE 6.4

Cut Scores on the Rasch Ability Scale, Associated Standard Errors, and Confidence Intervals for HSAP Content-Area Classifications

Content Area	Rasch Ability (θ)	SE(θ)	68% Confidence Interval	
			θ - 1SE	θ + 1SE
Mathematics				
Fall 2009				
Number and Operations	0.045	0.568	-0.523	0.613
Algebra	-0.223	0.480	-0.703	0.257
Measurement and Geometry	-0.056	0.483	-0.539	0.427
Data Analysis and Probability	-0.103	0.740	-0.843	0.637
Spring 2010				
Number and Operations	0.045	0.569	-0.524	0.614
Algebra	-0.030	0.487	-0.517	0.457
Measurement and Geometry	-0.053	0.477	-0.530	0.424
Data Analysis and Probability	-0.031	0.738	-0.769	0.707
Summer 2010				
Number and Operations	-0.008	0.548	-0.556	0.540
Algebra	-0.213	0.489	-0.702	0.276
Measurement and Geometry	-0.055	0.483	-0.538	0.428
Data Analysis and Probability	-0.049	0.742	-0.791	0.693
ELA				
Fall 2009				
Reading Process and Comprehension	0.020	0.442	-0.422	0.462
Analysis of Texts	0.202	0.550	-0.348	0.752
Word Study and Analysis	0.103	0.753	-0.650	0.856
Research	0.110	0.721	-0.611	0.831
Writing	0.096	0.418	-0.322	0.514
Spring 2010				
Reading Process and Comprehension	0.181	0.420	-0.239	0.601
Analysis of Texts	0.122	0.540	-0.418	0.662
Word Study and Analysis	0.346	0.827	-0.481	1.173
Research	0.434	0.741	-0.307	1.175
Writing	0.064	0.416	-0.352	0.480
Summer 2010				
Reading Process and Comprehension	0.037	0.424	-0.387	0.461
Analysis of Texts	0.241	0.521	-0.280	0.762
Word Study and Analysis	0.193	0.765	-0.572	0.958
Research	0.551	0.751	-0.200	1.302
Writing	0.144	0.400	-0.256	0.544

6.9 PERCENTAGE OF STUDENTS IN EACH ACHIEVEMENT LEVEL

Tables 6.6 through 6.11, below, present student performance on the fall, spring, and summer HSAP tests for mathematics and ELA. Percentages of students in the four achievement levels are reported for all students and for various subgroups. The summary includes all students who were tested but excludes students in adult education and district-approved homeschools. Tables 6.12 though 6.17 provide the information by content area. The information is summarized for Level 1 and at or above Level 2 for all students by gender and by ethnic group.

TABLE 6.5
Percentage of First Time Students Passing Both Tests

	Fall 2009	Spring 2010	Summer 2010
Percent Passed	67.70	78.53	100.00

TABLE 6.6

Fall 2009 HSAP Mathematics Operational Test: Percentage of Students in Achievement Levels Overall and by Subgroups (All Attempts)

	Achievement Levels				At or Above	At or Above	
Subgroup	**Level 1**	**Level 2**	**Level 3**	**Level 4**	**Level 2**	**Level 3**	***N***
Overall	57.7	31.6	6.7	4.0	42.3	10.7	13,345
Gender							
Female	56.7	32.8	6.8	3.8	43.3	10.5	6,424
Male	58.8	30.3	6.6	4.2	41.2	10.9	6,846
Invalid	41.3	37.3	14.7	6.7	58.7	21.3	75
Ethnicity							
African American	68.1	28.9	2.4	0.6	31.9	3.0	7,735
Asian/Pacific Islander	29.8	26.4	20.7	23.1	70.2	43.8	121
Hispanic	60.5	28.7	7.8	3.0	39.5	10.8	656
American Indian	39.1	43.5	8.7	8.7	60.9	17.4	23
White	41.4	36.6	12.9	9.1	58.6	22.0	4,336
Other	42.6	34.7	14.7	8.0	57.4	22.7	251
Unknown	37.2	33.6	17.0	12.1	62.8	29.1	223
ESL*							
Parent Waiver	40.0	60.0	--	--	60.0	--	15
Pre-Functional - Advanced	70.5	24.5	4.2	0.8	29.5	5.0	478
Initially English Proficient	10.0	40.0	10.0	40.0	90.0	50.0	10
Title III Exited	63.2	10.5	26.3	--	36.8	26.3	19
English Speaker I	40.8	28.6	22.4	8.2	59.2	30.6	49
English Speaker II	58.7	32.2	5.7	3.3	41.3	9.1	11,318
All others	46.7	28.7	14.6	10.0	53.3	24.6	1,456
Lunch Program							
No free/reduced lunch	46.2	33.9	11.6	8.3	53.8	19.9	5,538
Free lunch	66.8	29.4	3.0	0.8	33.2	3.8	6,939
Reduced lunch	58.1	34.0	5.2	2.8	41.9	7.9	868
IEP**							
Yes	80.1	18.8	0.9	0.2	19.9	1.1	3,696
No	49.1	36.5	9.0	5.5	50.9	14.4	9,649
Migrant							
Yes	70.0	20.0	10.0	--	30.0	10.0	10
No	57.7	31.6	6.7	4.0	42.3	10.7	13,335

* English as a second language

** individualized education program

TABLE 6.7

Spring 2010 HSAP Mathematics Operational Test: Percentage of Students in Achievement Levels Overall and by Subgroups (First Attempt)

	Achievement Levels				At or Above Level 2	At or Above Level 3	
Subgroup	**Level 1**	**Level 2**	**Level 3**	**Level 4**			***N***
Overall	18.4	30.8	26.4	24.4	81.6	50.8	52,653
Gender							
Female	16.3	32.0	27.2	24.5	83.7	51.7	25,936
Male	20.3	29.7	25.6	24.4	79.7	50.0	26,596
Invalid	46.3	24.8	14.9	14.0	53.7	28.9	121
Ethnicity							
African American	29.7	39.1	22.3	9.0	70.3	31.3	19,955
Asian/Pacific Islander	7.7	14.4	27.0	50.9	92.3	78.0	703
Hispanic	22.5	32.6	28.0	16.9	77.5	44.9	2,286
American Indian	21.8	37.3	25.5	15.5	78.2	40.9	110
White	10.2	25.3	29.2	35.3	89.8	64.5	28,437
Other	18.3	30.1	25.5	26.2	81.7	51.7	975
Unknown	49.7	25.1	13.4	11.8	50.3	25.1	187
ESL*							
Parent Waiver	22.4	40.8	24.5	12.2	77.6	36.7	49
Pre-Functional - Advanced	30.5	36.3	23.9	9.3	69.5	33.2	1,338
Initially English Proficient	16.7	12.5	25.0	45.8	83.3	70.8	24
Title III Exited	4.9	20.7	25.6	48.8	95.1	74.4	285
English Speaker I	9.1	19.5	29.0	42.3	90.9	71.4	241
English Speaker II	17.7	30.8	26.6	24.9	82.3	51.5	49,707
All others	44.9	28.9	16.2	10.0	55.1	26.2	1,009
Lunch Program							
No free/reduced lunch	10.8	24.4	28.7	36.0	89.2	64.7	27,222
Free lunch	28.3	38.1	22.9	10.8	71.7	33.6	21,713
Reduced lunch	16.2	35.0	29.4	19.3	83.8	48.7	3,718
IEP**							
Yes	60.2	27.9	8.9	3.0	39.8	11.9	5,980
No	13.0	31.2	28.6	27.2	87.0	55.8	46,673
Migrant							
Yes	29.4	47.1	11.8	11.8	70.6	23.5	17
No	18.4	30.8	26.4	24.4	81.6	50.8	52,636

* English as a second language

** individualized education program

TABLE 6.8

Summer 2010 HSAP Mathematics Operational Test: Percentage of Students in Achievement Levels Overall and by Subgroups (All Attempts)

	Achievement Levels				At or Above Level 2	At or Above Level 3	
Subgroup	**Level 1**	**Level 2**	**Level 3**	**Level 4**			***N***
Overall	61.5	34.9	2.8	0.8	38.5	3.6	252
Gender							
Female	57.4	38.8	2.3	1.6	42.6	3.9	129
Male	69.0	26.4	4.6	--	31.0	4.6	87
Invalid	58.3	41.7	--	--	41.7	--	36
Ethnicity							
African American	63.7	31.6	3.5	1.2	36.3	4.7	171
Asian/Pacific Islander	--	--	--	--	--	--	--
Hispanic	50.0	50.0	--	--	50.0	--	10
American Indian	--	--	--	--	--	--	--
White	58.8	38.2	2.9	--	41.2	2.9	34
Other	--	100.0	--	--	100.0	--	2
Unknown	60.0	40.0	--	--	40.0	--	35
ESL*							
Parent Waiver	--	--	--	--	--	--	--
Pre-Functional - Advanced	--	100.0	--	--	100.0	--	1
Initially English Proficient	--	--	--	--	--	--	--
Title III Exited	--	--	--	--	--	--	--
English Speaker I	100.0	--	--	--	--	--	1
English Speaker II	50.9	44.3	4.7	--	49.1	4.7	106
All others	69.4	27.8	1.4	1.4	30.6	2.8	144
Lunch Program							
No free/reduced lunch	60.2	35.9	2.8	1.1	39.8	3.9	181
Free lunch	66.7	30.3	3.0	--	33.3	3.0	66
Reduced lunch	40.0	60.0	--	--	60.0	--	5
IEP**							
Yes	68.2	27.1	3.5	1.2	31.8	4.7	85
No	58.1	38.9	2.4	0.6	41.9	3.0	167
Migrant							
Yes	--	--	--	--	--	--	--
No	61.5	34.9	2.8	0.8	38.5	3.6	252

* English as a second language

** individualized education program

TABLE 6.9

Fall 2009 HSAP ELA Operational Test: Percentage of Students in Achievement Levels Overall and by Subgroups (All Attempts)

	Achievement Levels				At or Above Level 2	At or Above Level 3	
Subgroup	**Level 1**	**Level 2**	**Level 3**	**Level 4**			***N***
Overall	51.5	31.3	9.8	7.4	48.5	17.2	10,181
Gender							
Female	45.8	31.7	12.4	10.0	54.2	22.4	4,260
Male	55.5	31.1	7.9	5.5	44.5	13.4	5,882
Invalid	61.5	25.6	7.7	5.1	38.5	12.8	39
Ethnicity							
African American	63.4	30.3	4.7	1.5	36.6	6.2	5,357
Asian/Pacific Islander	43.0	35.1	7.9	13.9	57.0	21.9	151
Hispanic	59.0	28.5	8.9	3.6	41.0	12.5	744
American Indian	33.3	23.8	33.3	9.5	66.7	42.9	21
White	33.5	33.7	17.0	15.8	66.5	32.8	3,516
Other	37.2	30.7	15.6	16.5	62.8	32.1	218
Unknown	39.7	25.3	16.7	18.4	60.3	35.1	174
ESL*							
Parent Waiver	65.0	35.0	--	--	35.0	--	20
Pre-Functional - Advanced	70.2	26.1	2.7	1.0	29.8	3.7	621
Initially English Proficient	12.5	37.5	37.5	12.5	87.5	50.0	8
Title III Exited	37.5	37.5	12.5	12.5	62.5	25.0	16
English Speaker I	37.8	42.2	15.6	4.4	62.2	20.0	45
English Speaker II	52.2	32.1	9.1	6.6	47.8	15.7	8,246
All others	38.0	28.2	17.6	16.2	62.0	33.8	1,225
Lunch Program							
No free/reduced lunch	36.4	32.4	16.3	14.9	63.6	31.2	4,215
Free lunch	63.2	30.4	4.8	1.7	36.8	6.4	5,351
Reduced lunch	52.7	32.7	8.9	5.7	47.3	14.6	615
IEP**							
Yes	75.6	22.0	1.9	0.4	24.4	2.3	3,003
No	41.3	35.2	13.1	10.3	58.7	23.4	7,178
Migrant							
Yes	50.0	35.7	14.3	--	50.0	14.3	14
No	51.5	31.3	9.8	7.4	48.5	17.2	10,167

* English as a second language

** individualized education program

TABLE 6.10

Spring 2010 HSAP ELA Operational Test: Percentage of Students in Achievement Levels Overall and by Subgroups (First Attempt)

	Achievement Levels				At or Above Level 2	At or Above Level 3	
Subgroup	**Level 1**	**Level 2**	**Level 3**	**Level 4**			***N***
Overall	14.2	31.6	28.5	25.7	85.8	54.2	52,611
Gender							
Female	10.5	29.7	30.1	29.7	89.5	59.8	25,932
Male	17.8	33.4	27.0	21.8	82.2	48.8	26,578
Invalid	35.6	34.7	16.8	12.9	64.4	29.7	101
Ethnicity							
African American	22.8	41.0	24.4	11.8	77.2	36.3	19,948
Asian/Pacific Islander	12.0	19.8	26.1	42.1	88.0	68.2	701
Hispanic	21.2	34.3	27.9	16.6	78.8	44.5	2,271
American Indian	19.8	30.6	32.4	17.1	80.2	49.5	111
White	7.7	25.1	31.5	35.7	92.3	67.2	28,464
Other	11.5	31.7	29.4	27.4	88.5	56.8	973
Unknown	42.7	28.0	15.4	14.0	57.3	29.4	143
ESL*							
Parent Waiver	12.2	59.2	24.5	4.1	87.8	28.6	49
Pre-Functional - Advanced	36.3	39.1	19.4	5.1	63.7	24.6	1,327
Initially English Proficient	4.2	20.8	45.8	29.2	95.8	75.0	24
Title III Exited	2.8	16.1	34.0	47.0	97.2	81.1	285
English Speaker I	7.2	20.7	29.5	42.6	92.8	72.2	237
English Speaker II	13.3	31.5	28.9	26.3	86.7	55.2	49,694
All others	36.1	33.0	19.7	11.3	63.9	31.0	995
Lunch Program							
No free/reduced lunch	7.4	24.1	31.2	37.3	92.6	68.5	27,175
Free lunch	23.2	40.3	24.6	12.0	76.8	36.5	21,712
Reduced lunch	12.0	35.8	31.6	20.5	88.0	52.1	3,724
IEP**							
Yes	53.9	35.1	8.8	2.3	46.1	11.1	5,985
No	9.1	31.2	31.0	28.7	90.9	59.7	46,626
Migrant							
Yes	44.4	33.3	11.1	11.1	55.6	22.2	18
No	14.2	31.6	28.5	25.7	85.8	54.2	52,593

* English as a second language

** individualized education program

TABLE 6.11

Summer 2010 HSAP ELA Operational Test: Percentage of Students in Achievement Levels Overall and by Subgroups (All Attempts)

	Achievement Levels				At or Above Level 2	At or Above Level 3	
Subgroup	**Level 1**	**Level 2**	**Level 3**	**Level 4**			***N***
Overall	71.4	27.8	--	0.8	28.6	0.8	133
Gender							
Female	60.0	38.3	--	1.7	40.0	1.7	60
Male	81.4	18.6	--	--	18.6	--	59
Invalid	78.6	21.4	--	--	21.4	--	14
Ethnicity							
African American	75.3	24.7	--	--	24.7	--	73
Asian/Pacific Islander	100.0	--	--	--	--	--	4
Hispanic	70.0	30.0	--	--	30.0	--	20
American Indian	--	--	--	--	--	--	--
White	50.0	45.0	--	5.0	50.0	5.0	20
Other	--	100.0	--	--	100.0	--	1
Unknown	80.0	20.0	--	--	20.0	--	15
ESL*							
Parent Waiver	--	--	--	--	--	--	--
Pre-Functional - Advanced	50.0	50.0	--	--	50.0	--	12
Initially English Proficient	--	--	--	--	--	--	--
Title III Exited	--	--	--	--	--	--	--
English Speaker I	100.0	--	--	--	--	--	1
English Speaker II	63.8	34.0	--	2.1	36.2	2.1	47
All others	79.5	20.5	--	--	20.5	--	73
Lunch Program							
No free/reduced lunch	79.1	19.8	--	1.2	20.9	1.2	86
Free lunch	59.1	40.9	--	--	40.9	--	44
Reduced lunch	33.3	66.7	--	--	66.7	--	3
IEP**							
Yes	70.3	29.7	--	--	29.7	--	37
No	71.9	27.1	--	1.0	28.1	1.0	96
Migrant							
Yes	--	--	--	--	--	--	--
No	71.4	27.8	--	0.8	28.6	0.8	133

* English as a second language

** individualized education program

TABLE 6.12

Fall 2009 HSAP Mathematics Operational Test: Content-Area Information (All Attempts)

Subgroup	Level 1				Level 2 and Above			
	Needs Improvement	*May Need Improvement*	*Adequate*	N1*	*Needs Improvement*	*May Need Improvement*	*Adequate*	N2**
Number and Operations								
All students	81.2	17.7	1.0	7,697	22.8	41.2	35.9	5,648
Females	84.6	14.9	0.5	3,640	27.1	40.9	32.0	2,784
Males	78.2	20.3	1.5	4,026	18.6	41.5	39.9	2,820
African Americans	82.7	16.7	0.7	5,270	32.3	48.6	19.1	2,465
Whites	77.3	20.8	1.8	1,795	15.5	35.5	49.0	2,541
Algebra								
All students	39.3	58.3	2.4	7,697	1.6	50.9	47.5	5,648
Females	34.0	63.3	2.8	3,640	1.2	48.9	49.9	2,784
Males	44.1	53.8	2.1	4,026	2.0	52.9	45.1	2,820
African Americans	38.1	59.4	2.5	5,270	1.5	60.6	37.8	2,465
Whites	42.6	55.3	2.1	1,795	1.8	44.5	53.6	2,541
Measurement and Geometry								
All students	62.7	36.9	0.4	7,697	7.1	56.6	36.3	5,648
Females	61.8	37.8	0.4	3,640	8.1	58.3	33.6	2,784
Males	63.4	36.1	0.4	4,026	6.2	55.1	38.7	2,820
African Americans	63.8	35.9	0.3	5,270	9.0	70.8	20.2	2,465
Whites	59.3	39.9	0.8	1,795	5.8	45.7	48.5	2,541
Data Analysis and Probability								
All students	27.9	63.4	8.7	7,697	2.1	47.1	50.8	5,648
Females	22.9	66.6	10.5	3,640	1.6	45.4	52.9	2,784
Males	32.4	60.6	7.1	4,026	2.5	48.8	48.8	2,820
African Americans	27.9	63.5	8.6	5,270	2.2	52.0	45.9	2,465
Whites	27.3	63.4	9.3	1,795	2.0	42.9	55.1	2,541

* total number of students in Level 1

** total number of students in Levels 2, 3, and 4

TABLE 6.13

Spring 2010 HSAP Mathematics Operational Test: Content-Area Information (First Attempt)

	Level 1				Level 2 and Above			
Subgroup	***Needs Improvement***	***May Need Improvement***	***Adequate***	**N1***	***Needs Improvement***	***May Need Improvement***	***Adequate***	**N2****
Number and Operations								
All students	70.5	27.2	2.4	9,690	4.0	24.6	71.5	42,963
Females	68.8	29.4	1.8	4,224	4.6	26.2	69.1	21,712
Males	71.6	25.6	2.8	5,410	3.3	22.8	73.9	21,186
African Americans	71.0	27.0	2.0	5,917	6.8	36.1	57.1	14,038
Whites	68.7	28.1	3.2	2,910	2.5	18.3	79.2	25,527
Algebra								
All students	58.4	39.7	1.9	9,690	2.4	28.4	69.1	42,963
Females	54.2	43.7	2.1	4,224	2.3	28.3	69.4	21,712
Males	61.6	36.6	1.8	5,410	2.6	28.6	68.8	21,186
African Americans	58.6	39.5	1.9	5,917	3.6	38.1	58.3	14,038
Whites	58.2	39.8	2.0	2,910	1.9	23.4	74.8	25,527
Measurement and Geometry								
All students	52.1	47.1	0.8	9,690	1.8	31.9	66.3	42,963
Females	49.9	49.3	0.8	4,224	1.8	32.3	66.0	21,712
Males	53.7	45.5	0.9	5,410	1.8	31.5	66.7	21,186
African Americans	52.5	46.7	0.8	5,917	3.0	47.0	50.0	14,038
Whites	51.1	48.0	0.9	2,910	1.1	23.9	75.0	25,527
Data Analysis and Probability								
All students	44.0	53.3	2.7	9,690	2.4	33.9	63.6	42,963
Females	42.2	54.8	3.0	4,224	2.4	34.9	62.6	21,712
Males	45.2	52.4	2.4	5,410	2.5	32.9	64.7	21,186
African Americans	44.0	53.3	2.7	5,917	3.4	45.8	50.8	14,038
Whites	44.0	53.4	2.6	2,910	1.8	27.2	71.0	25,527

* total number of students in Level 1

** total number of students in Levels 2, 3, and 4

TABLE 6.14

Summer 2010 HSAP Mathematics Operational Test: Content-Area Information (All Attempts)

Subgroup	Level 1				Level 2 and Above			
	Needs Improvement	*May Need Improvement*	*Adequate*	N1*	*Needs Improvement*	*May Need Improvement*	*Adequate*	N2**
Number and Operations								
All students	80.6	18.7	0.6	155	26.8	56.7	16.5	97
Females	78.4	21.6	--	74	29.1	52.7	18.2	55
Males	81.7	16.7	1.7	60	25.9	59.3	14.8	27
African Americans	81.7	17.4	0.9	109	32.3	56.5	11.3	62
Whites	75.0	25.0	--	20	7.1	57.1	35.7	14
Algebra								
All students	32.3	63.9	3.9	155	--	50.5	49.5	97
Females	27.0	68.9	4.1	74	--	43.6	56.4	55
Males	43.3	51.7	5.0	60	--	55.6	44.4	27
African Americans	34.9	59.6	5.5	109	--	45.2	54.8	62
Whites	25.0	75.0	--	20	--	71.4	28.6	14
Measurement and Geometry								
All students	50.3	49.0	0.6	155	9.3	70.1	20.6	97
Females	52.7	47.3	--	74	5.5	70.9	23.6	55
Males	50.0	48.3	1.7	60	14.8	59.3	25.9	27
African Americans	52.3	46.8	0.9	109	9.7	67.7	22.6	62
Whites	50.0	50.0	--	20	14.3	50.0	35.7	14
Data Analysis and Probability								
All students	31.0	63.9	5.2	155	5.2	56.7	38.1	97
Females	35.1	58.1	6.8	74	7.3	54.5	38.2	55
Males	30.0	66.7	3.3	60	3.7	55.6	40.7	27
African Americans	32.1	63.3	4.6	109	1.6	51.6	46.8	62
Whites	40.0	55.0	5.0	20	7.1	64.3	28.6	14

* total number of students in Level 1

** total number of students in Levels 2, 3, and 4

TABLE 6.15

Fall 2009 HSAP ELA Operational Test: Content-Area Information (All Attempts)

Subgroup	Level 1				Level 2 and Above			
	Needs Improvement	*May Need Improvement*	*Adequate*	N1*	*Needs Improvement*	*May Need Improvement*	*Adequate*	N2**
Reading Process and Comprehension								
All students	50.3	45.5	4.2	5,239	2.0	34.3	63.7	4,942
Females	44.3	49.9	5.7	1,953	1.5	29.4	69.1	2,307
Males	53.7	42.9	3.3	3,262	2.4	38.5	59.0	2,620
African Americans	50.1	45.7	4.2	3,399	2.9	45.0	52.1	1,958
Whites	51.8	44.5	3.6	1,179	1.5	27.5	71.0	2,337
Analysis of Texts								
All students	67.8	28.9	3.4	5,239	10.2	40.1	49.7	4,942
Females	67.9	29.0	3.1	1,953	10.5	38.0	51.5	2,307
Males	67.6	28.9	3.5	3,262	10.0	41.8	48.2	2,620
African Americans	68.1	29.2	2.7	3,399	15.7	49.9	34.4	1,958
Whites	63.7	30.9	5.4	1,179	5.8	32.6	61.5	2,337
Word Study and Analysis								
All students	49.2	48.2	2.6	5,239	6.2	55.9	37.9	4,942
Females	51.0	47.2	1.8	1,953	7.6	55.7	36.7	2,307
Males	48.0	48.8	3.2	3,262	5.0	56.0	39.0	2,620
African Americans	50.3	47.4	2.3	3,399	9.2	66.2	24.6	1,958
Whites	44.0	52.1	3.9	1,179	3.9	48.2	47.9	2,337
Writing								
All students	71.3	25.3	3.4	5,239	7.6	30.6	61.8	4,942
Females	67.0	29.1	3.8	1,953	5.2	27.7	67.1	2,307
Males	73.8	23.1	3.1	3,262	9.8	33.0	57.2	2,620
African Americans	71.0	25.9	3.1	3,399	9.4	39.3	51.3	1,958
Whites	68.7	26.5	4.7	1,179	5.9	23.8	70.3	2,337
Research								
All students	37.1	57.6	5.2	5,239	4.1	45.6	50.3	4,942
Females	37.3	58.1	4.7	1,953	4.4	45.0	50.6	2,307
Males	37.1	57.3	5.6	3,262	4.0	46.1	49.9	2,620
African Americans	36.6	58.4	5.0	3,399	5.5	58.6	35.9	1,958
Whites	38.6	55.3	6.1	1,179	3.0	35.6	61.4	2,337

* total number of students in Level 1

** total number of students in Levels 2, 3, and 4

TABLE 6.16
Spring 2010 HSAP ELA Operational Test: Content-Area Information (First Attempt)

Subgroup	Level 1				Level 2 and Above			
	Needs Improvement	*May Need Improvement*	*Adequate*	N1*	*Needs Improvement*	*May Need Improvement*	*Adequate*	N2**
Reading Process and Comprehension								
All students	46.8	46.2	6.9	7,490	0.4	13.0	86.6	45,121
Females	43.7	49.2	7.1	2,719	0.3	11.8	87.9	23,213
Males	48.6	44.6	6.8	4,735	0.4	14.4	85.2	21,843
African Americans	46.8	47.1	6.1	4,547	0.7	19.4	80.0	15,401
Whites	45.7	46.1	8.2	2,182	0.2	9.3	90.5	26,282
Analysis of Texts								
All students	64.1	31.4	4.5	7,490	5.8	27.5	66.7	45,121
Females	60.9	33.7	5.4	2,719	5.0	25.1	69.8	23,213
Males	65.9	30.1	4.0	4,735	6.6	30.0	63.4	21,843
African Americans	64.9	30.9	4.2	4,547	9.1	35.8	55.1	15,401
Whites	62.6	32.4	4.9	2,182	3.9	22.6	73.5	26,282
Word Study and Analysis								
All students	52.1	37.2	10.7	7,490	2.1	20.6	77.3	45,121
Females	52.6	39.2	8.2	2,719	2.3	21.2	76.5	23,213
Males	51.8	36.0	12.2	4,735	1.9	20.0	78.1	21,843
African Americans	53.4	37.2	9.4	4,547	3.7	28.3	68.0	15,401
Whites	48.3	37.9	13.8	2,182	1.2	15.9	82.9	26,282
Writing								
All students	75.5	23.0	1.5	7,490	3.7	21.1	75.2	45,121
Females	69.4	28.8	1.9	2,719	2.3	17.9	79.8	23,213
Males	78.9	19.7	1.3	4,735	5.1	24.5	70.3	21,843
African Americans	75.4	23.1	1.5	4,547	5.3	29.5	65.2	15,401
Whites	73.9	24.4	1.7	2,182	2.7	16.2	81.2	26,282
Research								
All students	44.4	51.8	3.9	7,490	3.5	40.2	56.2	45,121
Females	47.7	49.8	2.5	2,719	4.1	41.3	54.6	23,213
Males	42.4	52.9	4.7	4,735	2.9	39.1	58.1	21,843
African Americans	46.1	50.5	3.4	4,547	6.3	51.9	41.9	15,401
Whites	40.2	54.9	4.9	2,182	1.9	33.0	65.1	26,282

* total number of students in Level 1

** total number of students in Levels 2, 3, and 4

TABLE 6.17
Summer 2010 HSAP ELA Operational Test: Content-Area Information (All Attempts)

Subgroup	Level 1				Level 2 and Above			
	Needs Improvement	*May Need Improvement*	*Adequate*	N1*	*Needs Improvement*	*May Need Improvement*	*Adequate*	N2**
Reading Process and Comprehension								
All students	40.0	55.8	4.2	95	2.6	55.3	42.1	38
Females	36.1	61.1	2.8	36	--	66.7	33.3	24
Males	43.8	52.1	4.2	48	9.1	45.5	45.5	11
African Americans	36.4	60.0	3.6	55	--	61.1	38.9	18
Whites	50.0	50.0	--	10	--	50.0	50.0	10
Analysis of Texts								
All students	63.2	30.5	6.3	95	7.9	63.2	28.9	38
Females	63.9	30.6	5.6	36	12.5	50.0	37.5	24
Males	68.8	25.0	6.3	48	--	90.9	9.1	11
African Americans	65.5	27.3	7.3	55	--	72.2	27.8	18
Whites	40.0	60.0	--	10	20.0	50.0	30.0	10
Word Study and Analysis								
All students	40.0	58.9	1.1	95	15.8	71.1	13.2	38
Females	38.9	61.1	--	36	16.7	62.5	20.8	24
Males	41.7	56.3	2.1	48	18.2	81.8	--	11
African Americans	40.0	58.2	1.8	55	22.2	72.2	5.6	18
Whites	20.0	80.0	--	10	20.0	60.0	20.0	10
Writing								
All students	77.9	21.1	1.1	95	23.7	47.4	28.9	38
Females	66.7	33.3	--	36	25.0	45.8	29.2	24
Males	81.3	16.7	2.1	48	9.1	54.5	36.4	11
African Americans	70.9	27.3	1.8	55	27.8	50.0	22.2	18
Whites	60.0	40.0	--	10	10.0	30.0	60.0	10
Research								
All students	56.8	43.2	--	95	36.8	60.5	2.6	38
Females	66.7	33.3	--	36	41.7	54.2	4.2	24
Males	52.1	47.9	--	48	27.3	72.7	--	11
African Americans	54.5	45.5	--	55	33.3	66.7	--	18
Whites	60.0	40.0	--	10	40.0	50.0	10.0	10

* total number of students in Level 1

** total number of students in Levels 2, 3, and 4

6.10 DESCRIPTIVE STATISTICS

Descriptive statistics for scale score distributions are presented in table 6.18 for students overall, by gender, and by selected ethnic group.

TABLE 6.18

HSAP Summary Statistics Overall and by Subgroups (All Attempts)

	Mathematics			ELA		
		Scale Score			Scale Score	
Subgroup	*N*	Mean	Std. Dev.	*N*	Mean	Std. Dev.
Fall 2009						
All students	13,345	198.3	19.2	10,181	202.2	23.2
Females	6,424	198.8	18.3	4,260	205.9	24.1
Males	6,846	197.7	19.9	5,882	199.5	22.1
African Americans	7,735	193.2	13.9	5,357	195.1	17.5
Whites	4,336	205.9	22.8	3,516	212.7	25.8
Spring 2010						
All students	59,377	219.7	28.1	57,140	222.2	24.7
Females	29,242	220.5	27.3	27,693	225.9	23.8
Males	29,950	219.0	28.9	29,308	218.8	25.1
African Americans	24,621	207.4	21.5	22,933	212.2	22.3
Whites	29,952	229.8	28.8	29,446	230.6	23.2
Summer 2010						
All students	252	196.3	13.0	133	194.8	12.8
Females	129	197.6	13.8	60	197.5	15.7
Males	87	194.4	12.4	59	192.4	9.3
African Americans	171	196.0	13.3	73	194.1	9.1
Whites	34	197.7	13.6	20	204.5	22.4

Chapter 7

RELIABILITY

In this chapter, three types of reliability indexes are presented: reliability of raw scores, overall SEM, conditional SEM, and decision consistency at each achievement level.

7.1 RELIABILITY OF RAW SCORES

For the HSAP assessments, the reliability coefficients were computed using stratified Cronbach's alpha. As mentioned, the HSAP assessments included mixed item types: multiple choice, constructed response, and extended response. Although there are various techniques for estimating the reliability of test scores with multiple item types or parts (Feldt and Brennan 1989; Lee and Frisbie 1999; Qualls 1995), studies indicate (Qualls 1995; Yoon and Young 2000) that the use of Cronbach's alpha underestimates the reliability of test scores for a test with mixed item types. The stratified coefficient alpha (Qualls 1995) is defined as

$_{strat\,\alpha}\rho_{XX'} = 1 - \frac{\sum \sigma_{Y_j}^2 (1 - {}_{\alpha}\rho_{Y_jY_j'})}{\sigma_X^2}$, where σ_X^2 = the total score variance; $\sigma_{Y_j}^2$ = the score variance for a part-test j; and ${}_{\alpha}\rho_{Y_jY_j'}$ = the reliability of the part-test j.

Table 7.1 presents the reliability coefficients and SEM for mathematics and ELA for all students and subgroups. The maximum possible raw score is 71 in mathematics and 96 in ELA.

TABLE 7.1
Reliability Coefficients and SEM for HSAP Raw Scores

	Fall 2009 (All Attempts)	Spring 2010 (First Attempts)	Summer 2010 (All Attempts)
Mathematics			
Reliability	0.895	0.937	0.812
SEM	3.652	3.396	3.726
ELA			
Reliability	0.941	0.941	0.801
SEM	3.893	3.448	4.103

7.2 OVERALL AND CONDITIONAL SEM

Table 7.2 presents the classical test-theory SEM and the IRT-based conditional SEM at the scale score cut points. The SEM in the table are reported in units of scale score points. The classical SEM is defined as $s_x\sqrt{1 - r_{xx}}$, where s_x is the standard deviation of the scale score and r_{xx} is the reliability coefficient. IRT-based conditional SEM at the scale score cut points are defined as the reciprocal of the square root of the test information function at the point on the ability continuum that corresponds to the final scale score cut points (Hambleton, Swaminathan, and Rogers 1991). Although classical SEM and IRT conditional SEM both serve the same role, the value of IRT-based conditional SEM varies with ability levels, whereas the classical SEM does not.

TABLE 7.2
Classical and Conditional SEM for HSAP

Subject	Classical SEM	IRT-Based Conditional SEM		
		Level 2	Level 3	Level 4
Mathematics, Fall 2009	6.22	5.72	6.19	7.69
Mathematics, Spring 2010	6.99	5.56	6.17	7.76
Mathematics, Summer 2010	5.64	5.65	6.10	7.60
ELA, Fall 2009	5.64	5.62	6.41	7.74
ELA, Spring 2010	5.78	5.55	6.33	7.62
ELA, Summer 2010	5.70	5.38	6.38	7.84

Note: Spring statistics include only students taking the test for the first time.

7.3 CONSISTENCY OF ACHIEVEMENT LEVELS

When student performance is reported in terms of achievement categories, a reliability index is computed in terms of the probabilities of consistent classification of students as specified in the standard 2.15 in *Standards for Educational and Psychological Testing* (AERA, APA, and NCME 1999). This index considers the consistency of classifications for the percentage of examinees that would, hypothetically, be classified in the same category on a second HSAP administration using either the same form or an alternate, equivalent form.

Although a number of procedures are available for estimating misclassification errors (Livingston and Lewis 1995; Hanson and Brennan 1990; Huynh 1976; Subkoviak 1976), this report uses the beta binomial method (Huynh 1979). Table 7.3 presents a summary of agreements between the operational test classifications—that is, the percentages of students who would be consistently classified in the same achievement levels on two equivalent administrations of the test.

TABLE 7.3
Consistency Indexes for HSAP Achievement Levels

	Level 2	Level 3
Fall 2009 (All Attempts)		
Mathematics	84.3	92.6
ELA	87.6	91.6
Spring 2010 (First Attempts)		
Mathematics	92.5	88.5
ELA	93.1	87.7
Summer 2010 (All Attempts)		
Mathematics	79.0	96.0
ELA	79.0	98.9

Chapter 8

VALIDITY

Three types of validity evidence are reported in this section: test content, item fairness, and internal structure. Evidence on content validity is presented using the distribution of item content across content areas and the alignment of the HSAP test items with reference to the state academic standards. Evidence on item fairness is examined with the information on differential item functioning. Evidence on internal structure is provided in correlations among content areas.

8.1 ITEM DISTRIBUTION ACROSS STRANDS

The HSAP test forms were constructed from precalibrated item pools that had been created on the basis of the 2003 census field-test results. An analysis of field-test statistics determined that all items in these pools adequately measured specific knowledge and skills deemed appropriate for assessment by standardized tests. All items were reviewed by the Content Review Committee and the Sensitivity Review Committee (SRC) and approved by the SCDE. The HSAP test specifications are presented in section 4.2, above, in terms of distribution of score point values by content area.

8.2 ITEM DEVELOPMENT

All HSAP items were developed in alignment with the South Carolina academic and measurement guidelines. Various committees reviewed all items; only items reviewed by these committees and approved by the SCDE were included in the operational forms.

8.3 DIFFERENTIAL ITEM FUNCTIONING (DIF)

An important goal of test development is establishing an item pool that is fair to all students. All HSAP items were therefore reviewed for potential bias and for DIF. Specifically, the SRC reviewed the test items for bias with regard to language that might disadvantage a particular group of students, might be considered offensive to members of a particular group, or might present obstacles to a certain group due to factors unrelated to the content and processes specified in the state academic standards.

After data were collected, the DIF statistics were produced for a statistical review. A psychometric definition of the term *test fairness* is the degree to which an item performs similarly for different groups of equally able examinees. The term *DIF* refers to statistical properties of an item in two equally able groups and is subject to later interpretation and judgment. Once an item is flagged for a significant DIF, judgment is used to decide whether the difference in difficulty shown by the DIF index is unfairly related to group membership. DIF statistics should not necessarily be seen as indicators of bias or unfairness, but as indicators of relative strengths and weaknesses of the two groups being compared when the overall ability that the test is intended to measure has been controlled.

As with other statistical methodologies, there are numerous widely accepted approaches to detecting potential unfairness in test items. Many of these methods fall under the general category of DIF analysis.

Procedure

DRC calculated the Mantel-Haenszel statistic (MH D-DIF) for MC items (Holland and Thayer 1988) and standardized mean difference (SMD) for CR items (Zwick, Donoghue, and Grima 1993) to measure the degree and magnitude of DIF.

The examinee group of interest is the *focal* group; the group to which performance on the item is being compared is the *reference* group. In this report, the focal groups for DIF were female and African American. Based on the DIF statistics, items were separated into one of three categories (Holland and Thayer 1988; Dorans and Holland 1993): negligible DIF (A), intermediate DIF (B), and large DIF (C). The items in category C, which exhibit significant DIF, are of primary concern.

For MC items, positive values of *delta* indicate that a given item is easier for the focal group, suggesting that the item favors the focal group. A negative value of *delta* indicates that a given item is more difficult for the focal group. Similarly, for CR items, a positive SMD value implies that, conditional on the matching variable (i.e., a total score), the focal group has a higher mean item score than the reference group, thereby favoring the focal group.

For MC items, the item classifications are based on the Mantel-Haenszel chi-square and the MH delta (Δ) value as follows:

- The item is classified as C category if the absolute value of the MH delta value (i.e., |Δ|) is significantly greater than 1 and also greater than or equal to 1.5.
- The item is classified as B category if the MH delta value (Δ) is significantly different from 0 and either the absolute value of the MH delta (|Δ|) is less than 1.5 or the absolute value of the MH delta (|Δ)| is not significantly different from 1.
- The item is classified as A category if the delta value (Δ) is not significantly different from 0 or the absolute value of delta (|Δ|) is less than or equal to 1.

For constructed-response items, the item classifications are based on the Mantel chi-square and the SMD index as follows:

- The item is classified as C category if the Mantel chi-square *p* value is less than .05 and the absolute value of the SMD divided by the standard deviation of the item score (i.e., |SMD/SD|) is larger than .25.
- The item is classified as B category if the Mantel chi-square *p* value is less than .05 and the absolute value of the SMD divided by the standard deviation of the item score (i.e., |SMD/SD|) is larger than .17.
- All other items are classified as A category.

The Polytomous (Constructed-Response) DIF classification was defined as:

- Rule 1: $|Z_{SMD}| < 2.00$ was classified as A.
- Rule 2: $2.00 \leq |Z_{SMD}| < 5.00$ was classified as B.
- Rule 3: $5.00 \leq |Z_{SMD}|$ was classified as C.

When items for the operational forms were selected, each item's statistics from the initial field test were reviewed and approved by the SCDE. The inclusion of any "flagged" items on an operational form (i.e., items classified as C category) was possible only when the SCDE approved such inclusion.

Examining item results for DIF requires the use of a statistical test. When applied to large numbers of items, it is to be expected that a few items might be classified as category C due to Type I (false positive) errors. SCDE staff examined every flagged field test item for any potential sources of DIF. If none was found, the item was deemed acceptable for use on an operational form. Items on an operational form may be flagged for the same reason. Items that continue to be flagged for DIF are removed from the item bank. Tables 8.1, 8.2, and 8.3, below, report the numbers of items in the various DIF categories for ELA and mathematics for each administration.

TABLE 8.1

Fall 2009 Summary of DIF Classifications for HSAP Mathematics and ELA Items

Item Type	Reference Group	Focal Group	Total *N* of Items*	DIF Classification		
				A	B	C
Mathematics						
Multiple choice	Male	Female	62	60	2	0
Multiple choice	White	Black	62	52	10	0
Constructed response	Male	Female	3	0	2	1
Constructed response	White	Black	3	0	2	1
ELA						
Multiple choice	Male	Female	60	59	1	0
Multiple choice	White	Black	60	57	2	1
Constructed response	Male	Female	2	0	0	2
Constructed response	White	Black	2	0	0	2
Extended response	Male	Female	4	0	1	3
Extended response	White	Black	4	1	2	1

* The one extended-response item was scored over four domains and DIF was calculated for each of the individual domain scores.

TABLE 8.2

Spring 2010 Summary of DIF Classifications for HSAP Mathematics and ELA Items

Item Type	Reference Group	Focal Group	Total *N* of Items*	DIF Classification		
				A	B	C
Mathematics						
Multiple choice	Male	Female	62	57	5	0
Multiple choice	White	Black	62	58	3	1
Constructed response	Male	Female	3	1	0	2
Constructed response	White	Black	3	0	1	2
ELA						
Multiple choice	Male	Female	60	57	3	0
Multiple choice	White	Black	60	55	5	0
Constructed response	Male	Female	2	0	0	2
Constructed response	White	Black	2	2	0	0
Extended response	Male	Female	4	0	0	4
Extended response	White	Black	4	1	2	1

* The one extended-response item was scored over four domains and DIF was calculated for each of the individual domain scores.

TABLE 8.3

Summer 2010 Summary of DIF Classifications for HSAP Mathematics and ELA Items

Item Type	Reference Group	Focal Group	Total *N* of Items*	DIF Classification**		
				A	B	C
Mathematics						
Multiple choice	Male	Female	62	--	--	--
Multiple choice	White	Black	62	--	--	--
Constructed response	Male	Female	3	--	--	--
Constructed response	White	Black	3	--	--	--
ELA						
Multiple choice	Male	Female	60	--	--	--
Multiple choice	White	Black	60	--	--	--
Constructed response	Male	Female	2	--	--	--
Constructed response	White	Black	2	--	--	--
Extended response	Male	Female	4	--	--	--
Extended response	White	Black	4	--	--	--

* The one extended-response item was scored over four domains and DIF was calculated for each of the individual domain scores.

**Due to low N counts DIF was not calculated for the summer administration.

8.4 CORRELATIONS AMONG REPORTING CATEGORIES

Reporting categories for mathematics include the following five areas: Algebra (AL), Number and Operations (NO), Measurement and Geometry (MG), Data Analysis and Probability (DP), and integrated responses (IR). ELA includes the following five reporting categories: Reading Process and Comprehension (RC), Analysis of Texts (AT), Word Study and Analysis (WS),

Research (RS), and Writing (WR). Tables 8.4, 8.5, and 8.6 report the correlation matrices among the reporting category scores.

TABLE 8.4

Fall 2009 HSAP Correlations among Reporting Categories (All Attempts)

Mathematics (*N*=13,345)						ELA (*N*=10,181)					
Reporting Category	**NO**	**AL**	**MG**	**DP**	**IR**	**Reporting Category**	**RC**	**AT**	**WS**	**WR**	**RS**
NO	1	0.60	0.63	0.48	0.58	**RC**	1	0.70	0.65	0.64	0.64
AL	--	1	0.62	0.53	0.58	**AT**	--	1	0.63	0.55	0.57
MG	--	--	1	0.52	0.59	**WS**	--	--	1	0.53	0.55
DP	--	--	--	1	0.51	**WR**	--	--	--	1	0.50
IR	--	--	--	--	1	**RS**	--	--	--	--	1

TABLE 8.5

Spring 2010 HSAP Correlations among Reporting Categories (All Attempts)

Mathematics (*N*=59,377)						ELA (*N*=57,140)					
Reporting Category	**NO**	**AL**	**MG**	**DP**	**IR**	**Reporting Category**	**RC**	**AT**	**WS**	**WR**	**RS**
NO	1	0.73	0.73	0.69	0.72	**RC**	1	0.66	0.69	0.72	0.63
AL	--	1	0.76	0.70	0.70	**AT**	--	1	0.59	0.62	0.58
MG	--	--	1	0.73	0.72	**WS**	--	--	1	0.62	0.56
DP	--	--	--	1	0.69	**WR**	--	--	--	1	0.58
IR	--	--	--	--	1	**RS**	--	--	--	--	1

TABLE 8.6

Summer 2010 HSAP Correlations among Reporting Categories (All Attempts)

Mathematics (*N*=252)						ELA (*N*=133)					
Reporting Category	**NO**	**AL**	**MG**	**DP**	**IR**	**Reporting Category**	**RC**	**AT**	**WS**	**WR**	**RS**
NO	1	0.50	0.40	0.48	0.46	**RC**	1	0.42	0.28	0.40	0.18
AL	--	1	0.42	0.37	0.47	**AT**	--	1	0.24	0.42	0.16
MG	--	--	1	0.31	0.44	**WS**	--	--	1	0.20	0.11
DP	--	--	--	1	0.33	**WR**	--	--	--	1	0.17
IR	--	--	--	--	1	**RS**	--	--	--	--	1

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